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ABSTRACT

Many students have been taught to analyze, to memorize, and perhaps to synthesize, but few have been encouraged to be creative--a necessity for being truly satisfied, successful, and happy with one's life. To develop creativity, education should focus on an updated version of the 3 R's: Rationale, Reason, and Resourcefulness. Rationale involves making the purpose of educational pursuits clear to students by stressing the usefulness and value of liberal arts skills, such as listening, perceiving, questioning, and applying logic and order. Reason can be reinforced by using a Socratic teaching method to make students look within themselves, rather than to the teacher, for answers. Resourcefulness involves leading students to their own satisfying analysis of ideas based on understanding of their value systems. Two additional R's could be added to this list: helping students take Responsibility for their own education and Reach for their fullest potential. To satisfy the self-motivated student, who is seeking knowledge rather than grades, educators must blend traditional liberal arts skills with the skills of computers and other new technologies, combining the best of the old with the best of the new. (AYC)

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CLASSICS, QUILTING AND COMPUTERS

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CLASSICS, QUILTING AND COMPUTERS

As one grows older one begins to see life in terms of decades: one decade of college, one decade of babies, one decade of teenagers, one decade of advancing career, and at long last, one decade dedicated to that pursuit of happiness which is guaranteed in the constitution. Though there were times that I was not sure I would make it, I have finally reached that wonderful decade and I am pursuing happiness with great gusto. The kids are grown and gone and the grandchildren haven't yet begun, the career is in shape, the marriage is comfortable, and at last -- happiness is mine!

My main interests in life these days are three: Classics, quilting and computers. By classics I mean the study of the language and literature of the ancient Greek and Roman cultures. My graduate studies were in Latin, Greek and the classical civilization.

For relaxation I do quilting. Quilting, as you probably know, is the art of piecing back together small sections of material which you first have to cut apart. The last and latest of my three main interests is computer technology -- a topic of great interest to educators today. If you are wondering what connection there could possibly be between classics, quilting and computing....and what a classical scholar could possibly do with a computer, you are not alone. Many of my colleagues have asked similar questions. Many skeptics wondered how a non-technical Humanities person -- namely me -- could utilize the facilities in the faculty computer center at Valencia Community College. In pondering for myself the connection between my various interests, I realized that each of the things I most like to do is a challenging puzzle.

Trying to translate a Greek sentence into meaningful and understandable English is similar to the task of translating English into the simple logic of BASIC computer programming language. In each case the task requires the same process as my quilting hobby. First one takes apart the "whole cloth" of the sentence to analyze and understand the component parts. Then one must reassemble those parts into a unified whole in another "pattern", another language. Each task requires not only an understanding of all of the parts but a vision of the reassembled whole. One must be able to see analytically and holistically at the same time. One must be able to grasp patterns of relationships between seemingly divergent sections and always keep in mind the total pattern of the whole. Most of all, to really succeed at each challenge, one must be analytical,flexible, and creative.The last of these is the most important - - creative.

This summer I worked with a colleague on a new class at Valencia which we offered as a part of the Governor's Program for Gifted High School Students. We had two groups of brighter-than-average highly motivated students who

came to VCC in the middle of their summer vacation and took a difficult course for no credit. They were attentive, read the assignments, and did the required exercises -- but they seemed to me to be missing the one quality which I believe is vital to success in any venture -- they were not very creative. These students have been taught to analyze, to memorize, and perhaps to synthesize information but they have not been encouraged to be creative. Instead, they have learned to follow the directions and rules, to complete their assigned tasks in an acceptable manner, and to practice thinking in the same way their books and teachers think. This, they have learned,is the way to get good grades in school. It is not, however, the way to succeed in life, in computer technology or any other field.

To be truly satisfied, to be successful, to be happy with one's life, I believe that one must create. In the Introductory Humanities course which I teach at Valencia, I show a movie called " Why Man Creates". The answer given to the question posed is quite simple - - Man has a need to say to the world " I am here. I am me. I am unique. I am. " Man creates in order to become more real, more special, more human.

The computer, on the other hand, cannot create. Like a good servant it can only follow orders. The programmer, that unique, special human being, must create. The computer can only "output" what the programmer "inputs". If the person who creates the program cannot think creatively, the program will be imitative, restrictive and, nearly useless. In order to get the full benefit of computer technology -- the speed, the analytical branching possibilities, the instant correction and feedback -- and in order to get the best computer assisted instruction, the programmer must not simply transfer to the computer the techniques of the older instructional media --the seemingly endless lectures and the multiple choice exams-- but must think of new, interesting, and memorable ways to get ideas across. The possibilities are exciting; we have just begun to tap the potential.

The computer is a problem-solving tool. In order to utilize it most efficiently one must first define the problem. What needs to be accomplished? Then one must break the problem down into its component parts? What are the steps one must take to get each part of the task done? (This analytical breaking down of any task into its most minute parts is what programmers refer to as the algorithm, and these steps then become the little boxes and circles on the planner's flow charts.) Let's apply this computer-style thinking to some specific problem in the field of education. We will create a new "flowchart" for a new era in Education, one which will combine the best of the old with the best of the new.

FLOWCHART FOR THE NEW VERSION OF THE THREE R'S OF EDUCATION:
The old READING, 'RITING, & 'RITHMETIC become
RATIONALE----REASON----RESOURCEFULNESS-- and, if you like R's you could add two more --
RESPONSIBILITY --&--REACH

The first box on the flowchart is RATIONALE. In the field of Education today one problem is often discussed -- How to get the unmotivated, poorly equipped student to learn basic material?
Since that student seldom can see the purpose or foresee the outcome of learning the material, the first step in the new algorithm of Education ,therefore, is to provide a clear rationale.

In classical philosophy the question posed was often a consideration of the "good" of something. What is the good of education? The easiest answer is the practical one -- a good education will get you a good job. Even the dullest student working with that answer will soon point out that there does not seem to be a great market for many of the skills that we insist are important. How often have you seen an ad -- even in the New York Times -- for a poet, a philosopher, an essayist or an appreciator of music or art? Yet the students, equipped only with the idea that education is job related, are required to take classes in music appreciation, English composition, or philosophy. They are told by their advisors, even in the technical fields, that at least two or three of these Humanities courses are required. Most of the students, resigned to the inanity of educational requirements, proceed to take the required courses, planning to suffer through them and get them over with.

Imagine how different education could be and probably was before businesses convinced colleges that the purpose of education was to turn out good workers. The purpose of Education once was to make life more interesting by encouraging an awareness of beauty in fine art, eloquence in music and literature, and an appreciation for all of those creations of mankind which are studied in the Liberal Arts. The liberal arts were those which could be practiced by the freed man, the man liberated from the requirements of labor. Today a liberal arts education can make life more interesting for anyone, not just for the non-working elite. Unfortunately, the spectre of necessity has clouded the purpose of education. Granted we all must earn a living -- but we all should also be encouraged to LIVE an interesting life.

The first step, then, in creating an algorithm for problem solving in education, is to re-define the purpose of

education. Let us imagine that the task of every student in this re-defined educational system would be to find something interesting and valuable for living their own lives in each of their required courses. Then we the teachers will have to ensure that what we have to offer is, indeed, of value. First we must step back from our subjects and define that value for ourselves. Perhaps we can ask ourselves why it was that we pursued this topic, this major? We must have found something of value in at one time. What has it done for us? What is the "good" of it?

I had plenty of practice in this self-examination when I chose to pursue a master's degree in classics. More than once I was asked what was the "good" of learning Latin and Greek? I can say, with assurance, that the study of both languages gave me something useful for life itself. I learned to be creative in Greek classes when I discovered that every Greek word seems to have at least five possible translations in English, often with shades of important differences. When you realize exponentially the diversities which are possible in a simple sentence of ten words, then you can realize how many ways there are to get an idea across and how important it is to know as much as you can about the subject under discussion. You know, I am sure, how much easier it is to be sure you have understood the message in any form of communication if you know the person who is speaking personally, if you have a good grasp of the main ideas, if you are able to relate the examples given to the thesis and to your own life experience, and if you can understand such nuances as tone-of-voice and word emphasis. Obviously all of this is not possible in translating an ancient Greek author, but it certainly is possible when translating statements made in your own language. You learn to listen intuitively and intelligently, to question premises, to re-define terms,to pursue any topic until you are satisfied that you understand it.

Certainly this kind of listening and learning skill could help anyone in any field. During my graduate studies I spent a great many hours studying ancient Greek vases. Ostensibly, time wasted,if one thinks only in terms of the job market. There is no great demand for anyone who can tell the difference between a lekythos and and krater, even if that person could also determine the provenance and the approximate date of manufacture. The skill which I carried away from those studies, however, is very marketable-- I have learned to look intensely, describe minutely, make perceptive comparisons, see patterns of development. These are skills that any business major would envy.

The relationship between education -- that old-fashioned liberal arts education -- and the job market was brought to my attention most recently when I wrote to my mentor, a classics professor at the University of Massachusetts, and told him about my growing interest in computer assisted education. He wrote back that he was not at all surprised. It seems that there is a shortage of Latin

teachers in Massachusetts because the computer companies are picking them off to become programmers. Not only is the logic and order that they learn in Latin transferable, but their persistence in pursuing their seemingly unmarketable course of study suggests that they have the qualities a company looks for in its employees.

The second item in the flowchart for the new three R's is REASON. According to the Greek philosophers and playwrights reason is God's greatest gift to mankind. The Greek god of reason is Apollo (a name which I understand was chosen by a Japanese computer firm for their copy of the Apple computer.) Socrates, the great philosopher and devotee of Apollo, says that every man has the power to reason. Like a computer's memory, resident in the operating system, every person has this capacity to reason, to figure things out for themselves. A good teacher should help the student learn to use their own gifts of reason. We do far too much lecturing. One discovers that writing programs for Computer Assisted Instruction permits one little lecturing. Instead there must be a constant flow of dialectical question and answer. The same flow enlivens a classroom. Instead of telling students what to think, ask them what they DO think. Revive the old Socratic method. Force them to look within their own minds for the answers. For example if the assignment has been to read Chapter Two of whatever text you are using, start your class by asking the students to list the main ideas. If they are reluctant to talk, have them write the ideas down. If they have not read the assignment, which is often the case, tell them to get busy and find at least one main idea in the first pages while the other students write their lists. There will always be the reluctant students who are used to being told everything, but many will be surprised that they are being asked to think, for a change, and will try. After sufficient thinking time has elapsed, ask various students to read the items on their lists and write these on the blackboard. Write all of them, even seemingly inane ideas. Gradually all of the main ideas which you would have pointed out and explained in your lecture will be on the blackboard. Then ask the students to explain why they chose each item. Some will stumble, others will decide to withdraw their idea, recognizing that it is not vital, and others will be able to explain, with varying competencies, the importance of the concept which they have presented. In the discussion most students will feel free to ask questions since they do not feel that they are interrupting the lecturer. Students are more willing to challenge each other and will question conclusions presented by other students. Although a Socratic style class seems chaotic, the learning is far more effective than that which takes place in a formal lecture class. By using their own gift of reason the students discover most of the ideas which YOU think are important as well as other ideas which THEY think are important. By using their own reason they find the

"good" of any subject. Although they have done most of the work, they will go off and proclaim to all that you are the BEST teacher they ever had. Visiting teachers have said that they wished they had students as bright as those I have! They are always amazed to discover that the class they have observed is composed of the usual mix of average community college students. It is a beginning level course. There are no pre-requisites.

I have concluded that the Socratic method works-- in creative computer programming and in creative classroom teaching. I agree with Socrates-- every man has the power to reason (and,in the interest of equality, every woman has the power to reason as well.) All we as teachers can do is to act as facilitators and keep the reasoning flowing towards the goal. Which means,of course, that as teachers we must be clearly aware of that goal ourselves. We must know, as a computer programmer must know, not only the direction in which the flow of data is progressing but also towards what end. When such a flow is not clearly defined the users find themselves caught in a "loop" as they say in programming -- that is, going around and around again and again and getting nowhere. If this sounds like something that happens in your classroom, then perhaps you have not clearly defined the goal. If your goal is to have the students memorize data, then your students are being shortchanged. The computer has a far more accurate and accessible memory than a human. Why waste time on the endless memorization of data?
If, on the other hand, the goal of your teaching is to assist in the creation of new data, then your students are being readied for their own future.

The third item on our new list of the 3 R's of education is RESOURCEFULNESS.
The dictionary definition of resourcefulness is "able to deal skillfully with new problems and situations. One of the most interesting things that I have learned from my experiences with the computer is resourcefulness. If a program does not work one way, try another...and another...again and again. In "computerese" that process is often referred to as "de-bugging" -- it takes patience and fortitude and resourcefulness. Think about the word itself -- break it down into its component parts (there is that algorithmic logic again!)

RE= AGAIN and AGAIN
SOURCE = ORIGIN
FULL= AMPLE,PLENTY

Each part of that word is in itself an aspect of learning. As we all know from our own experiences, sometimes the only way to learn something is to return, again and again, to the source, to the origin - - to the primary material, whatever it may be - - which, we will find is full of ideas. Full, in fact of so many ideas we often are not sure which ones to choose from so ample a selection. Because of this, too many of our textbooks and other learning materials interpret for

the learner, telling the student what to think, which choices to make, what is the "right" interpretation. The creative thinker, on the other hand, can often come up with several different possible interpretations of any material. For example, every Christmas one phrase is printed on many a greeting card -- Peace on Earth, Good Will to Men. If you read the original Greek text of that Angelic choir's singing you will find it says --

GREEK καὶ ἐπὶ γῆς εἰρήνη ἐν ἀνθρώποις εὐδοκίας εὐδοκία *

(kie epi gaes eye-ray-nay en anthropois u-doke-ee-as u-doke-ee-a)

which can be translated "Peace on Earth to Men of Good Will" or "To Mankind, peace and good will" or, the most popular translation, "Peace on Earth, Good Will to Men." However, not only is there a great difference between "to men of good will" and "good will to men," but there is also an implication to consider. Does it mean that there will be peace only when mankind has "good will"? And, if that is so, how is that "good will" to be defined in relation to the concepts of Free Will and God's Will? As in all things that are worth thinking about, there are no simple and easy answers. Resourceful, creative and critical thinking are of help but in the final analysis the only arbiter is yourself. Your own subjective answer will be that which, after careful analytical thinking, you find most satisfying in relation to your own value system. How much better, then, to lead the students into their own satisfying analysis of ideas. It may be a delight to our own ego to try to instill in the students our own ideas, but their true learning will only come when they go through the process of resourceful, creative, critical thinking and arrive at their own answers. Education, after all, literally means to "lead out". As teachers we need to lead the students out of dependency on the thinking of others and out to the freedom of thinking for themselves. That, of course, is the meaning of the fourth AND fifth "Rs" I added to the original list - - RESPONSIBILITY and REACH.... The student who learns to think critically and analytically soon becomes responsible for his own education and need not be forced by teachers or the system to reach for his own full potential. That student learns the value of education for his own purposes. Grades become less important and the quality of education more important. In ZEN AND THE ART OF MOTORCYCLE MAINTENANCE, a study of quality in education, Pirsig poses a hypothetical case of a college drop-out, a mechanic who, after a few years in the so-called "school of hard-knocks", the working world, is ready to return to a more formal school because he has become bored with day-to-day shopwork. Pirsig says " His creative intelligence, stifled by too much theory and too many grades in college" becomes more interested in machine design after thousands of hours of frustrating mechanical problems. He knows he could design better machines himself. He would discover that he lacked the necessary theoretical information he needed - - mechancial

* Oxford Annotated Standard Edition Bible suggests the translation "...and on Earth peace among men with whom he is pleased" with a footnote suggesting that the lack of one letter in one of the Greek manuscripts changes the translation to "Those whom God has chosen in accord with his good pleasure."

engineering. So he would come back to school, but with a difference. To quote Pirsig directly " He'd no longer be a grade motivated person. He'd be a knowledge motivated person. He would need no external pushing to learn. His push would come from inside. He'd be a free man. He wouldn't need a lot of discipline to shape him up. In fact, if the instructors assigned him were slacking on the job he wo uld be likely to shape them up by asking rude questions. He'd be there to learn something, would be paying to learn something, and they'd better come up with it."
The kind of person Pirsig is describing is the kind of student we want in our classrooms. To get and keep those kinds of students we must do more than preserve on the computer the old forms of education. To satisfy that "free man" we must blend the old liberal arts skills with the new technological skills. We must combine computerized instruction with creative approaches to both learning and teaching. We must not simply re-instate the primacy of the old basic skills, we must also move on to the new BASIC language of the computer. Finally we must allay "computer phobia" by stressing to students and to colleagues that the computer and the robot can only replace those people who never learn to use those great gifts of creativity, resourcefulness, and reason.

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